

Our Ocean Backyard — *Santa Cruz Sentinel* columns by Gary Griggs, Director, Institute of Marine Sciences, UC Santa Cruz.

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Containers at Sea



The Ital Florida following encounter with large waves on its maiden voyage and suffering a "stack attack".

Earlier this year, on a voyage from Rotterdam to Sri Lanka, the Danish registered container ship, *Svendborg Maersk*, encountered hurricane force winds and 30-foot waves off the coast of France. After arriving at the Spanish port of Malaga, the ship's crew checked their cargo and discovered that stacks of containers on deck had collapsed and over 500 were missing.

On any typical day, between 5 and 6 million containers are on the high seas, moving between ports and full of everything from potato chips to refrigerators. But not all of them make it to their destination, as the crew of the *Svendborg Maersk* found out. Theirs was the largest reported single loss.

As the ship was undergoing repairs in Spain, the company's vice president of operations, stated that they are examining their procedures "to avoid similar incidents in the future." They also had to contact all of their customers to tell them that their shipments were at the bottom of the ocean. Not the message you want to receive, ever. Only 13 of the over 500 containers were recovered.

Floating low in the water, these twenty to forty-foot long steel containers present formidable dangers for smaller vessels. Most containers won't float for long, especially in heavy seas. Those that are refrigerated may be buoyed by their insulation, and the use of polystyrene as packaging can also keep them afloat longer. One marine insurer reports that a 20-foot container can float for up to two months, but a 40-foot container might float more than three times as long. Not the sort of surprise you want to encounter in a small vessel in the middle of the ocean.

Seven years ago, the container ship *M/V Ital Florida* left Hong Kong on April 20, for her maiden voyage, which was interrupted by what has become known as a "Stack Attack". This isn't a small vessel by any measure, at nearly 800 feet long and over 36,000 tons.

The new ship encountered 22 to 32 foot waves in the Arabian Sea between June 16 & 19, not enormous by rogue wave standards, but with hundreds of containers stacked 12 wide and 6 high on the deck, things began to unravel on the brand new vessel in a hurry.

The containers shifted under the wave impact and over 40 were lost overboard. Who knows what they contained, but they are under 10,000 feet of water on the pitch-black floor of the Arabian Sea.

Fortunately, before matters got worse, they were able to limp through the Red Sea and Suez Canal without encountering any pirates. They reached the port of Alexandria, Egypt, where the ship and load were straightened out.

The question that is always asked after these incidents is whether this was a result of bad weather, improper securing or lashing of the containers, overloading, or some combination. Failing to adequately secure the increasingly larger loads of containers against the stresses experienced during heavy seas appears to be the most frequent factor in failures.

Another issue, which appears to have been at fault in some even larger container ship disasters, is the loading and weights of the containers. In June of last year, 200 miles off the coast of Yemen, the 5 year old, 90,000-ton *MOL Comfort* literally snapped in half. Both forward and aft sections of the *Comfort*, as well as the entire load of 4,500 containers, went to the ocean floor. One factor being investigated is whether uneven loading of containers contributed to excess stresses on the hull.

These ships carry huge loads and frequently sail close to their maximum permissible stress or bending moments. A critical factor in the stresses acting on a ship is the weight distribution of the load of hundreds of containers. One uncertainty in the stability of container stacks is that these giant steel Legos are frequently not weighed, or that some shippers frequently understate the weight of their containers in order to reduce freight charges.

Not knowing how much your cargo weighs and how the weight is distributed along the length of a container ship can introduce all sorts of problems regarding the stress a vessel must endure at sea.

A proposal was put to the International Maritime Organization several years ago that containers be weighed before they were loaded. Many shipping groups objected to the proposal as expensive, time-consuming, and extended their port time. Perhaps not surprising, nothing was done.

Exactly what led to the *MOL Comfort's* sinking will probably never be known, as the answer lies deep beneath the waters of the Indian Ocean. As I write this we are sailing across the Indian Ocean from India to Mauritius, hoping for calm seas.